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PROCESS AND APPARATUS FOR CONDUCTING
AUCTIONS OVER ELECTRONIC NETWORKS

This application claims the benefit under 35 U.S.C. § 119(e) of co-pending

provisional application serial number 60/047,876 entitled "PROCESS FOR CONDUCTING

10 AUCTIONS OVER ELECTRONIC NETWORKS" filed May 29, 1997, which is

incorporated herein by reference.

BACKGROUND OF THE INVENTION

15   1.   Field of the Invention

The present invention relates to a method of conducting auctions, particularly

original issuer municipal bond auctions, over electronic networks, particularly the Internet.

2.   Description of the Prior Art

20   A conventional auction is a prior art process in which bids from bidders are received by an

auctioneer for an item to be sold. The bidder whose bid is the highest at the termination of the

auction (the "successful bidder") becomes the purchaser of the item.

Auctions may be conducted in a variety of ways. In the "silent real-time"

auctions bidders are made aware at all times of the magnitude of the current highest bid but

25   do not know the identity of the highest bidder. So long as the auction is still in progress, the

bidders may increase their bids. Silent real-time auctions generally end at a specific

announced time and any bid submitted by that time is considered in determining the

successful bidder.

Another style is the "public real-time" auction, in which bidders are made

30   aware both of the current highest bid and the identity of the bidder. Public real-time auctions

are conventionally held by open verbal outcry and are terminated by the fall of the

auctioneer's hammer after warning is given to the bidders of the imminent close of the

auction.

Other types of auctions are known. In a sealed-bid auction, bidders are given

35   the chance to make only one secret bid. They do not know either the current highest bid or

the identity of t●rent highest bidder. In a "silent and blind●on" the specific bids and identity of the bidders is maintained in secret until close of the auction. Yet other types of auctions differ from the foregoing in that offers to sell may be made by the auctioneer in decreasing price increments, the first buyer to accept a bid being the winner. This type of

5   auction is also known as a "Dutch flower auction." In another type, the winner is the party who makes the highest bid, but he pays the amount bid by the second-highest bidder. Many variations on these auctions are also known.

It is a drawback of the above types of auctions that the bidders must either gather together in the same physical location with the auctioneer or remain in contact with the

10   auctioneer by telephone or video conference facility. Bidders who are in the physical presence of the auctioneer may have an advantage because they are able to respond to the auctioneer's reaction to a bid more rapidly than those at remote locations are.

A variety of electronic auctioning and trading systems have been developed, including electronic auction systems relating to financial instruments. Examples of these can

15   be seen in U.S. patent Nos. 5,640,569 to Miller et al, 5,375,055 to Togher et al, 5,243,515 to Lee, 5,136,501 and 5,077,665 to Silverman, et al, 4,980,826 and 4,903,201 to Wagner, 4,789,928 to Fujisaki and 3,581,072 to Nymeyer.

The Miller patent is directed to an electronic "auctioning" system specifically directed to allocating computer resources such as transmission bandwidth of a multiplicity of

20   network links interconnecting the users. The system uses a type of second price sealed bid method. The system allocates resources to maximum declared values based upon the second highest bid such that successful bidders are charged what is referred to as an opportunity costs for the goods.

The Togher et al patent discloses a credit management system for an

25   electronic brokerage system. The brokerage system disclosed involves a communications network for facilitating the buying and selling of large blocks of foreign currency. In particular the system provides that each bid or offer for bid for a particular type of financial instrument is prescreened by the system for compatibility with limited credit information. The system identifies that, at least in currency, the resulting price may be based upon a

30   composite of bids for small sizes or lots of the currency in question.

The Lee patent discloses a secure teleprocessing bidding system relating to a secret bidding process. The system maintains the bids secret from other bidders until after the period for bidding is closed. The system is intended to eliminate bid procedure violations and provides an electronic record of the bids received.

35   The Silverman et al patents disclose an electronic trade matching system for trading instruments in which bids are automatically matched against offers for the given

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trading instrume ● he system uses a network to connect the ● omputer with bidding and offering clients of the system.

The Wagner patents disclose a voice actuated futures trading exchange. The system is described as a computerized public outcry exchange system for transacting sales of

5   a particular futures commodity contract by members of a futures trading exchange wherein bids to purchase or offers to sell the particular commodity are made by members through remote terminals and the exchange computer automatically matches offers and bids to complete the transaction. The system provides that the offers may be orally entered into the system.

10   The Fujisaki patent discloses an auction information transmission processing system that sets up a hierarchical system of host and server computers, which are configured to minimize the data transmitted between computers during an auction. The system is designed to allow auction participants to be spread out over a wide area. The system was directed to auctioning of specific items such as used cars.

15   None of the above described patents are directed to original issuer auctions of financial instruments. With auctions of various financial instruments there is a significant difference between the original issuer and subsequent resale of portions of this instrument in the secondary market. Once in the secondary market the financial instrument or portions thereof become fungible commodities appropriate for trading in various trading forums

20   including some of the electronic trading systems described above. The present invention is directed to original issuer auctions, which involve distinctly different issues than those associated with the secondary market.

None of the existing electronic trading or auctioning systems addresses the needs of original issuer auctions of financial instruments, such as municipal bonds. In the

25   domain of original issuer municipal bond auctions, conventionally competitive bids for new municipal bond offerings are submitted to the issuer via fax machine or US mail or in person and qualified bids must be for all of the bonds in the issue ("all-or-none"). In addition to fax submissions, 21st Century Municipals, Inc. has developed a modem based electronic bid submission system using a computer network and sold under the trademark PARITY. The

30   PARITY bid submission system allows bidders who have previously obtained and installed appropriate software to electronically submit bids in an auction over a computer network. The PARITY system is designed to be used together with fax and other bid submission methods during an auction. The PARITY system is designed as a sealed bid system such that the bids received are not reviewed until after the auction closes, and there is no feedback to

35   the bidders during the auction.

In a conventional original issuer municipal bond auction, there is a fixed time (e.g. 10:30 a.m., EST) on a predetermined date ("sale date") that bids must be delivered to the

issuer. Because ⬤rs are sensitive to on-going interest rate ⬤ments in the capital markets while preparing their bid, they prefer to wait until the last minute before submitting the bid to be as competitive as possible and avoid the risk that other bidders will learn the details of their bid before the deadline. This system essentially mimics a sealed bid

5   arrangement in this respect.

It is a drawback of bids submitted by mail that the bids must be submitted too far in advance to competitively reflect the market conditions when the bid is due.

It is a drawback of fax auction methods that faxed bids are transmitted after the deadline, fax clocks are not set properly and record the incorrect time in fax headers, fax

10   transmission interruptions outside the control of the sender and receiver and machine malfunctions such as paper misfeeds occur.

It is a drawback of in-person bidding methods that bidders have difficulty locating the place where bids are to be delivered or may experience traffic or other delays in submitting bids. Also, because the most frequent participants in competitive bids for new

15   issues are located in New York City and the issuers are in other parts of the country, it is extremely difficult for many bidders to deliver their bids in person.

It is a drawback of the PARITY bid submission system that to use electronic bid submission the bidders must previously obtain and install the appropriate software, resulting in essentially a closed computer network. An additional drawback with the

20   PARITY system is that no feedback is provided to the bidders. The system incorporates all of the drawbacks inherent in these other bid submission systems.

It is a drawback of prior art bidding methods for original issuer auctions of financial instruments that frequently bids are not submitted in conformity with issuers' specifications as set forth in a Notice of Sale or similar solicitation document. It is a

25   drawback of fax bid methods that faxes may not be legible at the receiving end. These problems can create controversy between bidders and embarrass municipal officials and their financial advisors conducting original issuer municipal bond auctions. They can also cost the issuer money (e.g. if the best bid has to be disqualified as a result of one of these malfunctions or mistakes).

30   Further drawbacks of prior art bidding methods in original issuer municipal bond auctions are:

1. Bidders cannot see bids submitted by other bidders and are thus precluded from using this information to make their bids more competitive;

2. Once having submitted a bid, a bidder is not given an opportunity to correct or

35   improve their bid in the event it does not conform in some way to the issuer's bids specifications;

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3. Bidders cann●●bmit bids for selected bond maturities; bid●●t be "all-or-none"; meaning they must purchase every single maturity in the issue or none of them;

4. Regional and small underwriters are precluded from submitting bids because they do not have sufficient capital or desire to purchase every maturity in an issue (i.e. all-or-none);

5. Institutional investors and other bidders who are not underwriters do not submit bids because they desire only selected maturities rather than all of the bonds in an issue;

6. There is a delay after bids are submitted and before awarding a contract to the successful bidder because it is necessary for the issuer to transcribe the bids into a computer spreadsheet or other program that computes which bid is the best one; furthermore, it is usually necessary to resize the principal maturity amounts after determining the winning bid, which results in further delays before the sale is made;

7. There is no effective security mechanism to reassure issuers that bids submitted via fax or other method are bona fide offers from qualified bidders;

8. There is no built-in safeguard that alerts bidders before submitting their bid when they attempt to make a bid which does not conform to the issuer's specifications (e.g., exceeding the issuer's premium or discount limitations, interest rate coupons which are not multiples of a predetermined percentage, etc.).

The prior art does not disclose a method of conducting original issuer municipal bond auctions mediated by computer in which the bidders may be distributed in different physical locations yet by which either a silent real-time auction or a public real-time auction may be conducted.

SUMMARY OF THE INVENTION

According to one embodiment, the present invention is directed to a computer implemented process comprised of the steps of: establishing communications over a network between an auctioneer's computer and a plurality of bidders' computers; providing information regarding financial instruments to be sold to potential bidders; submitting at least one of a maturity by maturity bid or an all-or-none bid via the bidder's computer; accepting one or more of the submitted bids; and displaying the current best bid while the auction is in process. Information in addition to the current best bid which may be displayed includes the identity of the bidder, showing the status of a plurality of bidders, or showing a no-bid status on a portion of the financial instrument.

The present invention also provides for selectively displaying selected auction and bid status information during the course of the auction to non-bidding observers

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of the auction v⬤ network on the observers' computers. Th⬤ws for third party observation of the auction in real time. The present invention can selectively provide information concerning the auction to participants and observers from the auctioneer's computer via the network after the closing of the auction.

5 　　　　The present invention also provides for verifying that each bid is in conformance with predetermined bid parameters and gives the bidder an opportunity to review and confirm bids prior to the bids being actually recorded on the auctioneer's computer. The bid verification may include automatically refusing acceptance of submitted bids that do not conform to predetermined bid parameters, and providing feedback to the

10 bidder of a proposed bid by providing the bidder with a summary of the proposed bid prior to bid submission. The present invention also screens bidders via the network to qualify bidders to submit bids and provides documentation of the qualification of the individual bidders.

　　　　The present invention includes an electronic bid calculation sheet, which is supplied to the bidder over the network, wherein the electronic bid calculation sheet allows

15 each bidder to prepare proposed bids including calculation of the cost of a proposed bid, and calculation of the various components of that cost including commissions, concessions, etc., prior to submission of the bid. The electronic bid calculation sheet is adapted to selectively display the bidder's last submitted bid without disturbing proposed bid information on the spreadsheet.

20 　　　　The operation of the present invention includes a plurality of computers that are connected to an electronic network, in particular the Internet. Each bidder may use their own personal computer. The bidders' computers are provided with commercially available browser software that communicates through the network with an auctioneer's server. Auction terms and conditions, and a description of the instruments to be auctioned, are

25 broadcast or otherwise made available by the auctioneer's server to the bidders' computers. During the auction the auctioneer's server broadcasts or otherwise makes available selected bid information such as bidder status (i.e., leader or not leader), or the current highest bid and, if desired, the identity of the current highest bidder. Software on the server, or perhaps on the bidders' computers in a JAVA implementation, guides the bidders through the bidding

30 process and provides computational assistance in preparing their bids and comparing them to the current highest bid. The bidder may prepare a tentative bid, review it and modify it before submitting it. A confirmation step may be implemented to insure that the bid is correct before it is submitted. When a bid is "submitted", it is compared with the current highest bid. If the submitted bid is higher than the current highest bid, it becomes the new current highest bid

35 and, if desired, is made available to all bidders. At the close of the auction, the auctioneer's computer notifies the bidders' computers of the successful bid. The auctioneer's computer also maintains a database of all bids which can be accessed by interested parties for their own

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use. Those and ⬤ advantages will be clarified in the descrip ⬤ f the preferred embodiment together with the attached figures in which like reference numbers represent like elements throughout.

5   BRIEF DESCRIPTION OF THE DRAWINGS

For the present invention to be easily understood and readily practiced, preferred embodiments will now be described, for purposes of illustration and not limitation, in conjunction with the following figures:

10   Fig. 1 illustrates a network over which the present invention may be practiced;

Fig. 2 illustrates an example of a home page from one implementation of the present invention;

Fig. 3a is a flow chart illustrating the overall process flow of the present
15   invention from a home page;

Fig. 3b is a flow chart illustrating the overall process flow with respect to the preparation and submission of a bid;

Fig. 3c illustrates the options available from an administration menu;

Fig. 4 illustrates a series of questions which may form a portion of the
20   registration process;

Fig. 5 illustrates an example of a selections page;

Fig. 6 illustrates an example of an observation page;

Fig. 7 illustrates an example of a log-in page;

Fig. 8 illustrates an example of an acknowledgment page;

25   Fig. 9 illustrates an example of a verification page;

Figs. 10 and 11 illustrate two examples of bid preparation/submission pages;

Fig. 12 illustrates an example of an error page;

Fig. 13 illustrates an example of a confirmation page; and

Figs. 14 and 15 illustrate two examples of administration pages.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention concerns original issuer municipal bond auctions in which a municipality ("Issuer") offers its bonds to purchasers, generally underwriters who
35   resell them to the public. The present invention is also applicable to corporate commercial paper, corporate bonds and notes, U.S. Treasury auctions, equity offerings, and, in general,

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any financial inst⬤nt. In a municipal bond auction, the mun⬤ity desires to raise the greatest possible amount of money for its bonds and therefore desires a large number of competitive bidders. Bids in municipal bond auctions may be complex because of the need to bid on a package of multiple bonds having differing principal amounts and maturity dates.

5   Comparing one's prospective bid against the current highest bid involves more than a simple comparison of two numbers. It is difficult to do this comparison rationally in real-time without computational assistance.

Bonds are offered to underwriters ("bidders") by means of two official documents prepared by the Issuer: a Notice of Sale and a Preliminary Offering Statement

10   ("POS" or "Prospectus"). The Notice of Sale describes the terms of the offering in detail. The POS describes the bonds being issued in detail, including such terms as the legal authority of the Issuer to issue them, a description of the security being offered to the purchaser, and the like. The terms of both the Notice of Sale and the POS are essential to the preparation of a bidder's bid.

15   In a preferred embodiment, the auction is conducted by an auctioneer hired by the Issuer to solicit and receive bids. As shown schematically in Fig. 1, in a preferred embodiment, the auctioneer is provided with a computer/server 10 connected to a network such as the Internet 12. The auctioneer maintains a web site on the Internet through the server that may be accessed by users. As used herein, the term "user" means any person who

20   accesses the auctioneer's web site, including the auctioneer, bidder, Issuer, Issuer's financial advisor or auction administrator. In a preferred embodiment, each user may use his or her own personal computer 14 connected to the Internet 12. Computers 14 are provided with conventional web browsing software to obtain access to the auctioneer's web site. A portion of one example of the home page 16 of the auctioneer's website is illustrated in Fig. 2.

25   The user is presented with a series of screens to guide him through the bidding process, illustrative examples of which are shown throughout the figures. In a preferred embodiment, the source code implementing these screens resides entirely in the auctioneer's computer 10 and is downloaded as HTML to the user's computer 14 as each screen is accessed. In an alternative embodiment, portions of the source code implementing

30   certain features remains resident on the user's computer, e.g. in the form of applets written in the JAVA language. In the preferred embodiment, the source code that supports operation of the auctioneer's web site is written in HTML (Hypertext Markup Language), PERL 5, and Mini SQL (Structured Query Language).

In a preferred embodiment, for security reasons each user must either register

35   or make arrangements in advance with the auctioneer to receive an identification number ("ID") to obtain access to auction information and to enter or review bids. Registration is schematically illustrated as elements 18 and 20 in Fig. 3a.

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applicant's web site, in particular the home ● 16, can be accessed by any interested person using URL http://www.muniauction.com.

The user who "visits" the auctioneer's web site is led through a sequence of web pages and may prepare and submit bids by typing entries and using conventional mouse clicks as in accessing a typical web site.

The site's home page 16, shown in Fig. 2, offers three links, an information link 22a to brochure 24 (Fig. 3a), a registration link 22b to registration pages 18, 20 (Fig. 3a) and auction link 22c to a selections page 26 (Fig. 3a).

The "Brochure" pages 24 are a description of the electronic auction, why it is useful, how it works, its benefits to issuers and bidders, special features and where to call for an on-line demonstration.

The "Registration" pages 18 and 20 contain appropriate forms to be completed by those interested in submitting bids. A portion of a web page 28 shown in Fig. 4 may be part of the registration page 18 shown in Fig. 3a. Parties must register so that their credentials can be verified prior to issuance of security information enabling them to make legitimate bids. Registration is necessary to prevent unauthorized persons from interfering with, or obtaining information about, the auction.

The "Auction" link 22c of home page 16 leads to the selections page 26 from which a user may enter the auction. An example of the selections page 26 is shown in Fig. 5.

The selections page 26 lists the bond auctions which are either completed, in progress, or anticipated. The auctions may be trial auctions in which users can view and practice bidding or real auctions. The listing may include the name of issuer, the state where the issuer is located, a brief description of the bonds being sold, the size of the issue, the scheduled auction date, and start time. Each possible auction may have a group of selections such as "Enter Action" for auctions upcoming or in progress, "Observe Results" for completed auctions, "View Notice of Sale", View Amendments", and "View POS". If the "Observe Results" option is chosen, the user is directed through branch 30 to page 32 (See Fig. 3a) in which the user may view the auction results which the issuer chooses to make available. See Fig. 6 for an example of an observation page 32. For example, the issuer may choose to show only the amount and name of winning bidders or may choose to display

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complete bid hist●or the auction. Preferably the informatio●made available after the auction will be disclosed in advance to the auction participants.

When an upcoming or current auction is selected at selections page 26, the user is directed through current auctions branch 34 to a login page 36 (See Fig. 3a). If the user selects "Enter Auction" for a trial auction, trial auction branch 38 takes the user to login page 40. The login page 40 may appear as shown in Fig. 7.

In the selections page 26, the user is provided with the multiple linked options "View Notice of Sale," "View Amendments", etc. Depending upon which issue is selected, the corresponding document will be displayed. That is shown collectively as "View Documents" 42 in Fig. 3a.

The "View Notice of Sale" option causes the complete text of the Notice of Sale to be displayed to the user. The Notice of Sale is provided to the auctioneer in advance by the Issuer, typically in machine-readable form, is converted to HTML or Adobe Acrobat, and stored on the auctioneer's web server for access by users.

The "View POS" option takes the user to an acknowledgment page shown in Fig. 8. To view the POS, the user must first acknowledge that the user is eligible to bid. If the user indicates that the user is not eligible, then the user returns to the selections page 26. Selection of the "eligible" option causes the complete text of the Preliminary Official Statement for the issue selected to be displayed. The POS is supplied to the auctioneer typically in machine-readable form by the Issuer, converted to HTML text or Adobe Acrobat, and then stored on the auctioneer's web server for access by users. Because the POS is a multi-page document, the auctioneer may create hypertext links to various parts of the POS from the items listed in the related table of contents to facilitate quick access by the user to selected portions of the document or rapid review and retrieval of information.

A "View Rules of Auction" link (not shown) may be provided which causes a text document stipulating the rules and conventions that all bidders must acknowledge or agree to abide by when participating in the auction. It also explains how disputes, if any, will be resolved, how bids are sequenced (e.g., first-in, first-out) and processed by the source code,

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what mathemati●mulas and conventions are used to calcu●rices and yields, and how purchase amounts may be altered after the auction to accommodate re-sizing.

The log-in page 36 is used to ensure that the user is identified and is verified to be legitimate. It requires the user, as a condition to entering the specific auction chosen, to enter its company identification number (ID) assigned by the auctioneer and their password, which is predetermined by the user. If the ID number or password is not correct as shown at step 44, the user will link automatically to an Error message (not shown) explaining that one (or both) is incorrect and that they should click the BACK button to return to the log-in page 36. After a correct log-in of a registered user is checked at step 44, the system checks at step 46 to determine if this registered user is admitted or allowed to participate in the selected auction, and verifies their status at step 48. If properly registered and admitted, the user is directed to verification page 50.

The verification page 50, an example of one type of which is shown in Fig. 9, is used as a double check on the identity of the user and to verify that the user, if bidding, agrees to abide by the rules of the auction. It contains a list of questions that must be answered affirmatively by clicking the "yes" response option after each one before the user can proceed to the auction page. If any of the questions is not answered or answered "no" as verified at step 52, the user will be linked to an error message 54 identifying the question (or questions) which has not been answered properly and directing the user to either contact the Administrator (by e-mail link) for assistance or click the BACK button to return to the verification page 50. The verification procedure provides a documented history that the user has reviewed the relevant materials including the Notice of Sale and POS. If an acknowledgement from the user, i.e. answering yes to all the questions, is not received, step 52 prevents the user from participating in the auction.

As shown in Fig. 9, three of the questions contain direct links to the Notice of Sale and Amendments, POS, and Rules of MuniAuction, respectively, which the bidder can view if the bidder has not already done so.

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ugh not currently implemented, the verifi● page 50 could also allow bidders to select the bid format they would like to use on the bid preparation and submission page 56 which follows, choosing either to enter the price and coupon combination or coupon and yield combination.

5   The bid preparation and submission page 56 is an electronic spreadsheet, or bid preparation sheet, representative examples of which are shown in Figs. 10 and 11 and are labeled "Auction." The bid preparation and submission page 56 displays a schedule of the principal maturity amounts 66 and due dates 68 for the issue to be auctioned as well as selected bid information 70 associated with the bid for each maturity.

10   The selected bid information 70 is predetermined by the issuer prior to the auction and is updated continuously throughout the auction. By displaying a current best bid, which is optional, an open bid auction may be implemented. The bid status information which is displayed to each of the users may include, for example, one or more of the following: the yield of a leading bid, the identity of leading bidders, the status of the bidders
15 (i.e., "Leader/Not Leader"), or a "no bid" status on a portion of the financial instrument. Any other appropriate information relating to the bids or the auction may also be included.

          Fig. 10 illustrates a blank form upon which a user may prepare a proposed maturity by maturity bid. The user enters a coupon and price, or yield, for each principal maturity it wants to purchase. To determine the yield associated with the price and coupon
20 combination (or the price associated with their coupon and yield combination) without actually submitting a bid, the user can click the "Calculate/Refresh" button 72, which calculates the yield (or price) without actually submitting it. If the user submits a bid and it results in a yield lower than the "best yield", whether shown or not, for that maturity, the user may choose to click the "Submit Bid" button 74 and become the new "Leader" with the "best
25 yield" for that maturity (provided time remains before the auction ends). In a maturity by maturity auction only, if no other bidder submits a better bid before the auction ends, then the leader becomes the successful bidder or "Winner" of the auction for the relevant maturity or maturities.

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●1 illustrates a blank form upon which the ●nay prepare a proposed all-or-none bid. The user enters a coupon for each maturity and an aggregate purchase price 77, and at the Issuer's option, a price or yield for each maturity. To determine the true interest cost (TIC) associated with the aggregate purchase price 77 and coupons combination

5   without actually submitting a bid, the user can click the "Calculate/Refresh" button 72 which calculates the TIC without actually submitting it. If the result is a TIC lower than the "best TIC" shown, if shown, the user may choose to click the "Submit Bid" button 74 and become the new "Leader" with the "best TIC" (provided time remains before the auction ends). In an all-or-none auction only, if no other bidder submits a better bid before the auction ends, then

10   the leader becomes the successful bidder or "Winner" of the auction.

In a maturity by maturity versus all-or-none auction, Figs. 10 and 11 apply to maturity by maturity and all-or-none bidders, respectively. The process of calculating and submitting bids is the same, but in this format, the best maturity by maturity TIC (i.e., the aggregate TIC associated with the best yields for each maturity submitted by one or more

15   bidders) is compared with the best all-or-none TIC (submitted by one bidder) and the lowest TIC of the two determines which bidder(s) is(are) the leader(s) or winner(s), during or once the auction is over, respectively.

The Calculate/Refresh 72 function is of great convenience. It can be implemented either in spreadsheet mode (in which a calculate/refresh operation is performed

20   each time any entry is changed), or in delayed mode (in which calculate/refresh is performed only on demand by the user). Additionally, the spreadsheet may display the last submitted bid in field 76, which displays to the user the last submitted bid by that user. In Fig. 10, field 76 is above a column that displays this information without overwriting the remaining sections of the spreadsheet. The electronic spreadsheet is therefore adapted to display the

25   users last submitted bid simultaneously with the bid information on the spreadsheet. In another embodiment, the bid preparation and submission page 56 may optionally assist the user in optimizing his bid.

According to one embodiment of the invention, at the option of the Issuer, if the user attempts to submit a bid which results in a higher yield than a bid it has already submitted which became the current leading bid, it is linked to an error message page (not shown) indicating that the user is attempting to submit a bid which is worse than one they

5   have already submitted. At that point the user should click the BACK button to return to the bid preparation and submission page 56.

Users may submit bids for one or more of the maturities listed or none at all. If a user submits a bid which does not conform to the specifications in the Notice of Sale (e.g., minimum/maximum price per maturity or coupon multiple parameters), it is linked to an

10   error message page, an example of which is shown in Fig. 12, describing which parameter is improper and instructing the user to click the BACK button to return to the bid preparation and submission page 56.

All bids must be submitted before the auction ends. The "Start" time, "End" time and current time or "Time of Last Update" may be shown at the top of the bid

15   preparation and submission page 56. Whenever users click the "Calculate/Refresh" button 72 or "Submit Bids" button 74, "Time of Last Update" is updated to the current time so that the user can keep track of how much time remains before the auction ends. In an alternative embodiment, "Time of Last Update" is updated automatically at brief intervals, for example, at one-second intervals.

20   After a user selects the submit button 74 and the bid is verified as conforming to the bid parameters, the bidder is presented with a confirmation screen, an example of which is shown in Fig. 13, to confirm the bid prior to submission. As shown in Fig. 13, a summary of the bid is presented to the user in this confirmation. If confirmed, the bid will be electronically submitted to the auctioneer computer 10. The confirmation gives a safety

25   check to users to help them avoid the submission of erroneous or undesired bids.

The bid preparation process and submission process described above is summarized in the flow chart in Fig. 3b. Beginning with the bid preparation and submission page 56, the user can select "calculate/update" 72, "submit bid" 74 or "retrieve bid" 76 as

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described above. Additionally the user may save a proposed bid step 78 in which case the user is asked to name the file at step 80 for future recovery of the bid. Previously saved proposed bids may be viewed by selecting "view bid" 82 in which case the user is prompted to identify the file containing the saved bid at 84 and the file is retrieved and displayed at step

5   86.

In selecting the calculate/update option 72 a check is made at step 88 to determine if the calculation is meaningful in the context of the given auction. If the calculation is meaningful the displayed bid is updated at step 90. If the calculation is not meaningful, the nature of the error is determined at step 92 and the bidder is informed of the

10   error with proposed corrections at step 94 unless the auction is over in which case the user is taken to the observation page at step 96. The proposed corrections to an error in the bid will allow the user to restore a previous correct bid at step 98 or go back to allow the user to correct the current proposed bid at 100.

In a similar fashion to the calculation/update process, the submit bid process

15   verifies that the bid to be submitted it meaningful and in accordance with the appropriate predetermined bid parameters for this auction at step 102. If an error is present in the bid, the error is examined at step 104 in the same manner as step 92 of the calculation/update process. Thereafter, the process proceeds with either step 94 or 96 as discussed above. If the bid was valid at step 102, then confirmation is requested at step 106 wherein the user is displayed a

20   summary of the bid prior to bid submission as described above. If the bid is confirmed by the user at step 108 it is submitted and recorded by the auctioneer's computer 10 at step 110.

Returning to Fig. 3a, the Observation mode 112 provides a special page for the Issuer and Issuer's financial advisor, or appropriate third party observers, to view the auction in progress. It shows the selected bid information of bids submitted. The observer

25   can view a running list of best bids 114, individual bids 116 and cover (i.e., second place) bids 118. Such information may be displayed in a manner very similar to that shown in Fig. 6. As with the observe results page 32, the information illustrated on the relevant pages 114, 116, and 118 regarding the bids is predetermined before the auction. A particular Issuer may

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not wish to have all ●d information, such as non-winning bid hi●s, listed. The observation pages are updated throughout the auction by clicking the "Refresh" button. In an alternative embodiment, the observation pages are continuously updated. The observation page may be automatically accessed by Issuer and Issuer's financial advisor when "Enter

5   Auction" is clicked and after these users enter a special ID number and password at the login page 36. The observation mode 112 also accommodates other requests of information stored in the database from users as schematically illustrated at element 120 in Fig. 3a.

The Observation mode may show the true interest cost of individual bids when there are bids for every maturity in the issue and winning bids and cover bids. It also

10   may show the "resized" principal maturity amounts that coincide with the Notice of Sale parameters, the Issuer's objectives (e.g., level annual debt service), and a summary of all bids submitted by bidders.

The trial auction branch 38 leads to the login page 40 and a verification page 124 which operate similar to the login page 36 and verification page 50, respectively,

15   previously described except that the login page 40 allows any user to select whether they want to go to the trial auction page 126 where they can practice bidding or the observation page 112 where they can observe bids. The trial auction 126 is one or more screens which simulate a real auction such that a bidder can become accustomed to the operating system without entering into an actual auction. From the trial auction page 126 the user is provided with a

20   plurality of options such as viewing various documents, returning to the home page, etc.

The Administration menu 128 is for use by the technical staff of the auctioneer to create, modify or terminate auctions, add or remove bidders, allow user access to applicable pages (e.g., bidders to the auction page and Issuers to the observation page), and view auctions in progress. The operation of the administration menu 128 is schematically

25   illustrated in the flow chart of Fig. 3c and two of the web pages accessible therefrom are shown in Figs. 14 and 15. These pages may also show the true interest cost of the winning bids and the resized principal amounts as described above.

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In ● 3c, the administrator can list registrants at ● 123, add/delete registrants at step 125, or modify registrant information at step 127 as shown in Fig. 14. The administrator can view an ongoing auction at 129, release selected auction data for completed auctions at step 130, create or modify up-coming auctions at step 132 as shown in Fig. 15,

5   delete an auction at step 134, restart an auction at step 136, view and/or set permission parameters at step 138, and open/close trial auctions at step 140. In the viewing of the auction at 129, the administrator may select best bids at 142, cover bids at 144, individual bids at 146, or a summary at 148 for viewing. In creating or modifying up-coming auctions at step 132, the administrator may choose to create or modify existing documents at 150 which will take

10   him to the selected document at step 152, or may choose to set and or change auction parameters at 154 and/or maturity dates and amounts at 156.

At the end of an action, all winning bidders will automatically receive preliminary e-mail confirmations of their winning bids and purchase amounts (as resized), as well as a reminder that when the Issuer has made the formal award of bonds, they will receive

15   another, final, e-mail confirmation 130.

A bidders log is provided containing a record of every bid submitted by every bidder during an auction. It identifies the bidder, the ID number and password entered by the bidder, the responses by that bidder to the questions on the verification page and the entries made by the bidder which were submitted as bids, whether winning bids or not.

20   Electronic mail (e-mail) confirmation is automatically generated to users on the occurrence of selected events. When a registered bidder enters its ID number and password, an e-mail confirmation is immediately sent to confirm the fact that they have entered an auction. If, for example an impostor somehow succeeds in impersonating a bidder, the bidder will receive e-mail showing that the auctioneer believes the bidder has entered the

25   auction. This serves as a cross-check for security purposes.

The present invention provides several advantages over the prior art such as allowing bidders from around the world to participate simultaneously in a real-time auction of an original issuer financial instrument, providing bidders in an original issuer auction with

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computational t●uch as spreadsheets, with which to comp●nd compute associated

cost values with their bids, providing facilities for the auctioneer in an original issuer auction

to receive and evaluate bids in real-time, allowing for anonymity in silent real-time auctions

or full disclosure in open auctions, requiring submitted bids to be within the Issuer's

5 parameters, and increasing the speed at which bidders may bid so that the largest number of

bids can be submitted prior to the close of an auction.

Following are further advantages of the present invention relating to original

issuer actions of financial instruments:

1. Replacing bidding by fax, personal delivery or other methods;

10 2. Providing an integrated system running on a single server that:

(a) allows bidders to prepare bids and submit them without transcribing them or using

extraneous commercial software or equipment such as Bid Comp, Monroe Bond

Calculators, Bond Buyer Worksheets, interfaces, etc.;

(b) enables issuers, financial advisors and third party observers to view auctions in

15 progress including selected bid information such as winning bids and bidders;

(c) may automatically send documentation in the form of electronic confirmations of

bidder admission to auction and winning bids;

(d) may calculate true interest cost (TIC) of winning bid combinations and resize issue

without requiring the Issuer or financial advisor to run separate software programs or

20 customize spreadsheet programs;

(e) permits the auction administrator to create, modify and view auctions in progress;

and

(f) provides one on-line location where the Notice of Sale and Preliminary Official

Statement (POS) can be viewed (and amended by the Issuer) to assist bidders in

25 preparing bids;

3. Allowing primary offerings of municipal bonds to be conducted as real-time

auctions in which bidders can view selected bid information such as the best bid for

each maturity and are given the opportunity to make a better offer while the auction is in

progress;

30 4. Obviating the need for special software or hardware installation at the bidders', or

Issuer's locations by allowing bidders and Issuers to use any personal computer, any

Internet service provider and any web browser;

5. Allowing bids to be submitted for selected bond maturities within a new issue,

rather than exclusively on an all-or-none basis;

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6. Allowing an ●●●oneer to conduct multiple auctions simult●●●●sly using the same web server and a single administrator;

7. Allowing bidders to participate in a plurality of auctions simultaneously or consecutively;

8. Improving the security of auctions by providing bidders and other parties that access bidding information with electronic signatures via an identification number and password and to log all bids submitted by each bidder throughout an auction;

9. Obtaining electronic verification from bidders that they have read and agree to certain legal documents associated with a bond issue, retaining their responses in a log, and if they answer "no" that they have not read the documents or do not agree with them, denying such bidders access to the auction until they answer "yes";

10. Providing a bidder with automatic notification describing any non-conforming entry via error messages when a bid does not conform to the Issuer's specifications in a Notice of Sale;

11. Providing a built-in official auction clock that keeps bidders informed of time remaining before the auction ends; and

12. Enabling bidders to recalculate and refresh a display of aspects of their bids, including calculated yield or prices associated with their entries before submitting them as formal bids.

The above described system is intended only to be illustrative of the present invention and not restrictive thereof. For example, one anticipated operation of the present invention will be to conduct all-or-none and maturity by maturity auctions for the same Issuer where the individual bidders status is not displayed to the bidder, but only a display of which maturities have not yet received a bid is presented to the bidders during the auction as the selected bid information. Additionally the present invention may be designed to allow bids to be prepared by existing information services and have these loadable into the present system through steps 84/86 shown in Fig. 3b.

Another aspect of the present invention is that it allows appropriate third parties to create and conduct auctions. If multiple separate administrators are allowed then additional security may be added to limit an administrator's access to only those auctions which it is controlling.

Further options of the present system may include:

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1) Saving of ●repared on the present system for later ac●nd retrieval by the bidder;

2) Automatic ranking and rating of bids received to determine the best bids, wherein numerically tied bids may be broken by the time of receipt of the bids;

3) Allowing institutional investors to view the contact information for bidders who have requested access to a given auction;

4) Having bidders select to submit bids at re-offering rates and prices;

5) Having the auctioneer identify whether a bidder's bid is priced at yield to call or yield to maturity, as applicable;

6) Having the calculations be moved to the client side to reduce the hits on the home page server and increase bidder's privacy and susceptibility to network delays; and

7) Having bidders presented with the option of digitally signing bids for security which would use known standard signature schemes in either a separate or JAVA integrated utility.

It will be appreciated that although the embodiments described herein relate to financial instruments such as municipal bond auctions, the disclosed process is applicable to many other types of auctions. Various modifications may be made to the present invention without departing from the spirit and scope thereof. It will be apparent to those skilled in the art how to adapt the present invention to variant types of auctions. The scope of the present invention is to be defined by the appended claims.